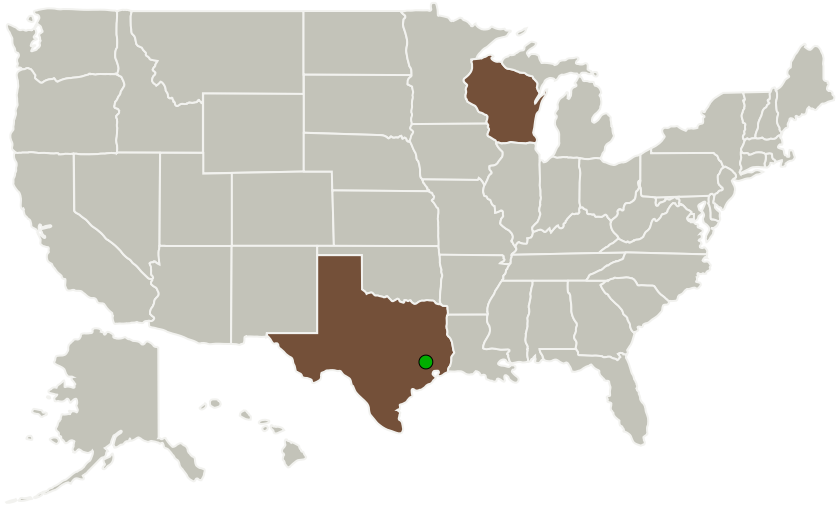
Non-Thermal Sanitation By Atmospheric Pressure Plasma, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

ORBITEC proposes to develop a non-thermal technology based on atmospheric-pressure (AP) cold plasma to sanitize foods, food packaging materials, and other hardware and working surfaces that are encountered during food processing in space vehicles or habitats. AP plasma is well known to be highly effective in promoting oxidation, enhancing molecular dissociation, and producing free radicals and other types of high energies. It has recently attracted much attention in food industry due to its potential of being a non-thermal and highly effective sanitation method. The proposed technology will support sanitation of food preparation surfaces and equipment, food storage containers, and surface sanitation of delivered fresh fruit and vegetables, and freshly prepared foods in a space based habitat. It can function in reduced gravity and pressure environments, and is efficient in terms of waste and resource use. It may also have applications in air and water purification, allowing some sharing of components and training procedures. During this Phase I effort, two different reactor designs will be built and tested. Their performance will be evaluated on tomato, lettuce, Teflon, and/or other non-food substrates, all of which will be inoculated with Salmonella enterica.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Sierra Nevada Corporation(SNC)	Lead Organization	Industry Women-Owned Small Business (WOSB)	Sparks, Nevada
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas
Orbital Technologies Corporation	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Madison, Wisconsin

Primary U.S. Work Locations	
Texas	Wisconsin

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140223)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Sierra Nevada Corporation (SNC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

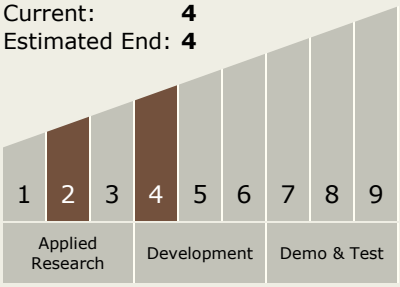
Carlos Torrez

Principal Investigator:

Russell C Manzke

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.5 Food Production, Processing, and Preservation

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System